

REMARKS

Claims 35, 36, 38-50, and 61-64 are currently pending in this application. In a previous Amendment dated February 12, 2003, independent claim 35 was narrowed in scope to distinguish over the prior art of record by including the amendatory language "wherein the pasty composition is applied to the substrate in the form of discrete, substantially semi-spherical islets having a diameter of 10 μ to 1000 μ ." The prior art of record does not disclose the new and unexpected results of a substantially higher absorbent capacity of a substrate as a result of the use of small islets having a diameter of 10 μ to 1000 μ . As discussed in detail below, the present specification and the enclosed Declarations of Dr. Harald R. Schmidt provide convincing evidence to establish new and unexpected results throughout the entire claimed range (i.e., 10 μ to 1000 μ).

In a first Declaration of Dr. Harald R. Schmidt dated January 10, 2003, test data was obtained on a substrate wherein absorbent material was applied to the substrate in a regular pattern of islets having a diameter of 250 μ as described in Example 1 (page 2). A swelling height of 1 mm was obtained which corresponds to the absorbent capacity of the substrate, which is the same value disclosed on page 7, lines 15-20 of the present specification. The first Declaration also compares the absorbency of a substrate having a full surface coated layer (i.e., no discrete particles) and a substrate having a regular pattern of islets with a diameter of about 1300 μ , both of which fall outside the claimed 10 μ to 1000 μ islet range. The substrate with the full surface coated layer (i.e., Comparison Example 1) resulted in a swelling height of only 0.2 mm. The substrate with the islets having a diameter of about 1300 μ (i.e., Comparison Example 2) similarly resulted in a swelling height of only 0.25 mm.

In a second Declaration of Dr. Harald R. Schmidt dated November 24, 2003, additional test data was obtained on substrates wherein absorbent material was applied to each

of the substrates using a screen having a mesh width of 550 μm and 355 μm , respectively, which corresponds to a substrate with islets having a diameter of 170 μ and 120 μ , respectively. The substrate with the islets having a diameter of 170 μ resulted in a swelling height of 0.44 mm and the substrate with the islets having a diameter of 120 μ resulted in a swelling height of 0.60 mm. The Declarations thus corroborate that substrates having a layer of islets within the diameter range of 10 μ to 1000 μ according to the claims demonstrate new and unexpectedly good results compared to substrates having a layer of islets outside the diameter range of 10 μ to 1000 μ . As illustrated in the attached graph entitled "Absorbency Data," prepared by the undersigned, the curve of the available data corroborates the new and unexpected swelling height results throughout the claimed range of 10 μ to 1000 μ . Therefore, one of ordinary skill in the art can easily ascertain a probative trend in the exemplified data in support of the claimed range.

The Examiner has variously rejected the claims for asserted anticipation by or obviousness over U.S. Patent No. 4,076,663 to Masuda et al. (hereinafter "the Masuda patent"), U.S. Patent No. 4,154,898 to Burkholder, Jr. (hereinafter "the Burkholder patent"), U.S. Patent No. 4,017,653 to Gross (hereinafter "the Gross patent"), U.S. Patent No. 5,246,770 to Bottiglione et al. (hereinafter "the Bottiglione patent"), U.S. Patent No. 5,275,884 to Nishino et al. (hereinafter "the Nishino patent"), and/or U.S. Patent No. 4,321,997 to Miller (hereinafter "the Miller patent").

The present invention, as claimed in independent claim 35, is directed to a substrate comprising a super-absorbent material applied to the substrate, wherein the super-absorbent material is obtained by allowing suitable monomers to polymerize in the presence of a catalyst in order to obtain a pre-cross-linked polymer solution. Next, a cross-linking agent containing two functional groups which are capable after thermal excitation of reacting within at least ten minutes with carboxylate or carbonic acid functional groups is added to the polymer

solution to obtain a pasty composition. Finally, the pasty composition is subsequently applied on or in the substrate in the form of discrete, substantially semi-spherical islets having a diameter of 10 μ to 1000 μ and allowed to dry for one to three minutes at between 150°C and 200°C to form a swellable paste.

The three primary references cited by the Examiner are the Masuda patent, the Burkholder patent, and the Gross patent. Except for the substrate having super-absorbent material in the form of discrete, substantially semi-spherical islets having a diameter of 10 μ to 1000 μ , the Examiner asserts that the substrates described in the three primary references are identical or slightly different than the substrate of the present invention. Therefore, the Examiner contends that it would have been obvious to optimize the shape and size of the super-absorbent material to obtain a substrate having predetermined absorbency properties. Applicant respectfully disagrees with the Examiner's assertions on the basis of new and unexpected results detailed in the specification and accompanying Declarations, as summarized above.

The Masuda patent describes a highly water-absorbent resin produced by polymerizing cellulose with another monomer in the presence of a crosslinking agent and, optionally, adding a catalyst. The water-absorbent resin can be applied to various substrates by any known method, such as immersing (i.e., full surface coated layer) the substrate into an aqueous solution of the resin and subsequently dried. See column 6, lines 3-17. The Masuda patent discloses only a substrate having a full surface coated layer of absorbent material. A substrate having a full surface coated layer as described in the Masuda patent was tested for absorbency in Comparison Example 2 of the Declaration. The results indicate that a full surface coated layer has a substantially lower swelling height (i.e., 0.2 mm) in contrast to the swelling height (i.e., 0.44 mm, 0.60 mm, and 1 mm) of the substrates having the regular pattern of islet with a diameter between 10 μ and 1000 μ . The motivation to optimize the shape and size of the

absorbent surface coated layer cannot come from Applicant's specification. Therefore, there is no motivation, suggestion, or reasonable expectation of success to modify the surface coated layer in the Masuda patent and arrive at the new and unexpected results of a substrate having five times the absorbent capacity.

The Burkholder and Gross patents are very similar to each other. The Burkholder patent describes water-soluble absorbent articles made from crosslinking carboxylic polymers, wherein the polymers are at least partially crosslinked and are then coated on a surface. The Gross patent describes a use of water-swellaable absorbent articles made from crosslinked or cured polymer, wherein the crosslinking agent is added to a polymer solution and the solution is subsequently coated onto a surface and crosslinked further. Both the Burkholder and Gross patents describe a coating step that can be a complete coating (i.e., full surface coated layer) or a discontinuous coating. A discontinuous coating includes, for example, applying the composition to a substrate in a pattern of large dots, squares, or grid lines to retain the inherent flexibility of the fibrous substrate and, at the same time, vastly improving its water absorbency (See column 3, lines 5-17 of Burkholder and column 4, lines 17-30 of Gross). By the use of the adjective "large" before the terms dots, squares, or grid lines, the Burkholder and Gross patents teach away from the application of small diameter patterns (i.e., 10 μ -1000 μ) for increasing the water absorbency of a substrate. The Burkholder and Gross patents teach that as the size and/or diameter of a discontinuous coating pattern increases, the absorbent capacity of a substrate vastly improves versus a substrate having full surface coated layer. This teaching is contrary to the results identified in the present specification and illustrated in the Comparison Examples 1 and 2 of the accompanying Declaration, in which the continuous coating and the 1300 μ islets are shown to provide inferior absorbency compared to the claimed 10 μ to 1000 μ islets. One skilled in the art could not have learned the benefits associated with the 10 μ to 1000 μ islets absent

consulting the present specification, and the obviousness rejection of claim 35 and any claim dependent thereon may, thus, be seen to be in condition for withdrawal.

The Bottiglione, Nishino, and Miller patents are directed to coal dust and absorbent substrates, respectively, and do not teach or suggest the 10 μ to 1000 μ islet diameters or the new and unexpected results attributable thereto. Because all of the pending claims are now limited to the 10 μ to 1000 μ diameter size of islets, none of the Bottiglione, Nishino, or Miller patents is able to disclose or teach the present invention as claimed, and withdrawal of rejections based on these three references is respectfully requested.

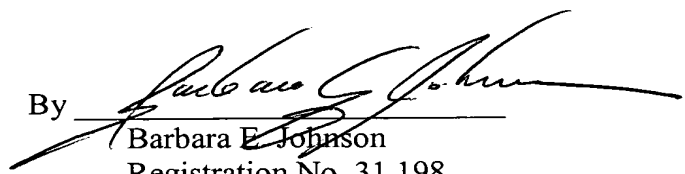
CONCLUSION

Based on the foregoing remarks and the enclosed Declarations Under 37 CFR §1.132, reconsideration of the rejections and allowance of pending claims 35, 36, 38-50, and 61-64 are respectfully requested.

Respectfully submitted,

WEBB ZIESENHEIM LOGSDON
ORKIN & HANSON, P.C.

By



Barbara E. Johnson
Registration No. 31,198
Attorney for Applicant
700 Koppers Building
436 Seventh Avenue
Pittsburgh, PA 15219-1818
Telephone: (412) 471-8815
Facsimile: (412) 471-4094
E-mail: webblaw@webblaw.com